

Protecting workers against hazardous substances in EC

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Content

- **EC legislations**
- **Protection against**
 - Diesel engine exhaust**
 - Gasoline engine exhaust**

EC legislations

- **Council Directive 89/391/EEC**
- **Council Directive 98/24/EC**
 - Commission Directive 2000/39/EC**
 - Commission Directive 2006/15/EC**
 - Commission Directive 2009/161/EC**
- **Directive 2004/37/EC**
- **Regulation (EC) No 1272/2008**

**Aiming at a better support in protecting the health and safety
of workers exposed to chemicals**

Council Directive 89/391/EEC

introduction of measures to encourage improvements in the safety and health of workers at work

additionally

- **Council Directive 91/383/EEC: workers with a fixed duration employment relationship or a temporary employment relationship**
- **Council Directive 92/85/EEC: pregnant workers and workers who have recently given birth or are breastfeeding**
- **Council Directive 94/33/EC: protection of young people at work**

Council directive 98/24/EC

on the protection of the health and safety of workers from the risks related to chemical agents at work

- minimum requirements for the protection of workers from risks to their safety and health arising, or likely to arise, from the effects of chemical agents that are present at the workplace or as a result of any work activity involving chemical agents
- indicative and binding OELV and biological limit values
- development of standardised methods for the measurement and evaluation of workplace air concentrations in relation to occupational exposure limit values
- employers obligations
- risk assessment
- specific protection and prevention measures
- BOELV: inorganic lead and its compounds 0,15 mg/m³
(binding biological limit value also established)

Implementation of Council Directive 98/24/EC

- **Commission Directive 2000/39/EC**
first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work
- **Commission Directive 2006/15/EC**
second list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Directives 91/322/EEC and 2000/39/EC
carbon dioxide 9000 mg/m³ (5000 ppm)
- **Commission Directive 2009/161/EC**
third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Directives 91/322/EEC and 2000/39/EC

Directive 2004/37/EC

Protection of workers from the risks related to exposure to carcinogens or mutagens at work

- **Carcinogen:** a substance which meets the criteria for classification as a category 1 or 2 carcinogen set out in Annex VI to Directive 67/548/EEC (also preparation with one or more carcinogens)
- **Mutagen:** ... category 1 or 2 mutagen ...
- Determination and assessment of workers' risks
- Reduction and replacement of carcinogens / mutagens
- Prevention and exposure reduction
- Annex III: LIMIT VALUES FOR OCCUPATIONAL EXPOSURE
 - Benzene: 3.25 mg/m³ (1 ppm)
 - Vinyl chloride: 7.77 mg/m³ (3 ppm)
 - Hardwood dust: 5.00 mg/m³

Regulation (EC) No 1272/2008

Classification, Labelling and Packaging of substances and mixtures

- Incorporation of the internationally agreed GHS criteria
- Harmonisation of the provisions and criteria for the classification and labelling of substances, mixtures and certain specific articles
- Application to all substances and mixtures supplied in the Community
- two instruments foreseen to be used to communicate the hazards of substances and mixtures: labels and the safety data sheets



GHS08

signal word: danger

hazard statement: H350

may cause cancer

precautionary statements: P201, ...

(for prevention, response, storage, disposal)

Occupational Exposure Limit Values

Indicative values

- based only on scientific considerations
- member states must establish a national occupational exposure limit taking into account the Community indicative limit values

Binding values

- based on scientific considerations and taking into account socio-economic and technical feasibility factors
- national values can be stricter but cannot exceed the Community binding values

Diesel and gasoline engines

complex exhaust mixtures of different compounds

Gasoline engine: CO₂, CO, NO_x, hydrocarbons, particles, ...

Diesel engine: CO₂, NO_x, DPM (diesel particulate matter = diesel engine emissions), hydrocarbons, ...

exposure reduction of exhaust components by

exhaust aftertreatment

catalysts

particle filter

exhaust ventilation

Gasoline engine exhaust at workplaces

e. g. car repair shops, garages, parcel services

	Europe Member states	USA (OSHA)
Carbon monoxide	25 – 50 ppm (29 – 55 mg/m ³) SWE: 20 ppm (25 mg/m ³) if the source is exhaust gas	50 ppm (55 mg/m ³)
Carbon dioxide	5000 ppm (9000 mg/m ³)	5000 ppm (9000 mg/m ³)
Nitrogen monoxide	25 ppm (30 mg/m ³) D: 0.5 ppm (0.63 mg/m ³) - MAK	
Nitrogen dioxide	2 – 3 ppm (4 – 5.7 mg/m ³) EU: 0.2 ppm (IOELV proposal) D: 0.5 ppm (0.95 mg/m ³) – MAK	STELV: 5 ppm (9 mg/m ³)

Car repair shops

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New investigations in 2011:

Workplace measurements in car repair shops with

- Sensor based ventilation
- Transport buggys
- Shifting cars
- Gates at each workplace
- Riding slip-on extraction

Applying PIMEX system

Establishing control guidance sheets



diesel engine exhaust at workplaces

e. g. car repair shops, garages, parcel services, freight forwarding, fire brigades stations, loading and unloading of ships, ...

	Europe, Member states	USA (OSHA)
Diesel engine emissions	AUT: TRK (based on technical feasibility) underground mining: 0.3 mg/m ³ for the rest: 0.1 mg/m ³	--
Carbon dioxide	5000 ppm (9000 mg/m ³)	5000 ppm (9000 mg/m ³)
Nitrogen monoxide	25 ppm (30 mg/m ³) D: 0.5 ppm (0.63 mg/m ³) - MAK	
Nitrogen dioxide	2 – 3 ppm (4 – 5.7 mg/m ³) EU: 0.2 ppm (IOELV proposal) D: 0.5 ppm (0.95 mg/m ³) – MAK	STELV: 5 ppm (9 mg/m ³)

Diesel Particulate Matter (DPM)

- **IARC (International Agency for Research on Cancer):**
diesel engine exhaust: probably carcinogenic (2A)
- **US EPA: acute effects with respect to health, such as eye, throat and bronchial irritation, light-headedness, nausea, cough and phlegm were evident;**
DPM: lung cancer was evident in occupationally exposed groups
- **AIOH (Australian Institute of Occupational Hygienists Inc.)**
workers exposure to DP levels should be controlled to below 0.1 mg/m³

Control Guidance Sheet: Fire brigades

- Separated garages (from lounge and service rooms)
- Access only for instructed employees
- No storage or change of overalls and clothes in the garage
- Technical exhaust ventilation (underpressure)
- garages with two or more parking spaces
 - permant extraction of exhaust gases at the end of the pipe or
 - use of built-in or slip-on diesel particle filters (DPF)
according to the FOEN filter list (filtration efficiency > 97 %)

...

All measures are in accordance with the Technical Rule for hazardous Substances (TRGS) 554 „Exhausts from diesel engines“